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BUREAU OF
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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

OFFICE OF MYCOLOGY AND DISEASE SURVEY

Vol. XIV October 15, 1930 Number 20

DISEASES OF ORNAMENTALS

PACIFIC COAST SURVEY FOR ROSE MOSAIC

By Freeman Weiss, Pathologist, Office of Horticultural Crops and Diseases, and Frank P. McWhorter, Associate Plant Pathologist, Oregon Agricultural Experiment Station.

During July, 1930, the writers inspected many of the larger rose plantations in the States of Washington and Oregon, and a brief inspection was made of similar plantings in the Vancouver district of British Columbia. The survey was continued by Weiss during the first half of August in southern California and Texas. The object was to determine the distribution of the disease known as mosaic or infectious chlorosis, with particular reference to its occurrence in rose understocks, but with reference also to the susceptibility of the different varieties of budded roses and the disease symptoms exhibited therein.

Owing to the controversial nature of the subject, in particular as to the nature of the disease and the extent to which it occurs in propagating stocks grown on the Pacific Coast; also, since the expression of symptoms is extraordinarily variable, sometimes being very obscure, and since the symptoms are not always clearly distinguishable from environmental effects and from insect injuries, it seems best not to attempt at this time a detailed analysis of the observations. Arrangements are being made to secure samples of all the types of roses used for propagation, and all the varieties in which the disease, or symptoms suggestive of it, have been reported, for growing under uniform conditions at Washington, D. C. and at Corvallis, Oregon, for a period of prolonged observation.

The proper terminology for this disease is also unsettled. White (White, R. P. An infectious chlorosis of rose. American Rose Annual 1930: 87-90. 1930) who first brought it to the attention of pathologists, says, "Due to the localization of the chlorotic areas and the infectious nature of the malady, the disease -- is more properly referred to for the time being as "infectious chlorosis." It is true that in budded roses - chiefly Hybrid Tea varieties - under greenhouse conditions, the chlorotic effects are exhibited principally in the paren-

chyma tissue abutting on the larger veins - most conspicuously the mid-vein. This is not always the case in the types of roses grown for propagating, nor in some of the Hybrid Perpetual varieties observed with symptoms suggestive of this disease. In the Manetti rose the chlorotic areas are either minute and numerous or large and few, and may be distributed over the entire leaflet or may be concentrated toward the tip and periphery, but usually are not conspicuously centered about the mid-vein or its principal branches. Some of the chlorotic flecks even appear to be interveinal. This is not strictly comparable to the type of mottling characteristic of such virus infections as tobacco or cucumber mosaic where alternating patches of the leaf parenchyma are chlorotic or normal, but the general appearance of a severely diseased Manetti shoot is suggestive of the symptoms of crinkle mosaic in Bliss Triumph potato leaves. When viewed by transmitted light chlorotic patches in the parenchyma may be seen, and this is even more evident in some other varieties, e.g. Climbing American Beauty. The question of the infectiousness of this disease need not affect the choice of name because recognized mosaic diseases are known which show the same behavior, as regards transmission by grafting, as the rose disease, e.g. the mosaic disease of Abutilon thompsoni. Peach yellows would also come in this category. Furthermore, the possibility of insect transmission of the rose disease is still an open question. For the present the writers will employ the term rose mosaic.

The observation of principal interest made on this survey is that Rosa odorata which has not heretofore been reported as infected, and which was not infected in White's experimental inoculations, although Rosa multiflora was, is by no means immune. Plantings of R. odorata were observed in which at least 5 per cent infection, with well marked and even extreme symptoms, occurred. This observation was first communicated to McWhorter by growers who had noticed these symptoms in R. odorata in 1929 and it was confirmed by our inspection of field grown plants. A California grower had independently demonstrated the susceptibility of R. odorata, by budding healthy roots with diseased Hybrid Tea buds. A grower who well knows the symptoms of this disease stated that he has observed it also on Souvenir de Claudius Pernet, a variety of contested susceptibility, on which it produced very marked symptoms, but though we are inclined to credit this report we did not investigate the case.

Definite leaf symptoms of this disease were found in the Hybrid Perpetual rose Mrs. John Laing, and a considerable proportion of the plants in one block, which were in excellent condition otherwise, showed the symptoms, but the vigor of shoot growth was not appreciably impaired. The only previous record of this disease in a Hybrid Perpetual rose is White's(l.c.) inclusion of the variety J. B. Clark in his list of susceptible varieties. Subsequently, other H. P. types, particularly Magna Charta and Ulrich Brunner, were observed in Texas with rather definite symptoms of mosaic, and at St. Louis, Mo., these and several additional H. P.'s showing suggestive symptoms were noted. More recently still, marked and characteristic symptoms of this disease were observed on the H. P. roses Marshall P. Wilder and Paul Neyron growing in a nursery in New York State. The affected plants are not however, seriously reduced in vitality.

The hybrid Wichuraiana, Climbing American Beauty, also showed in one instance distinctive symptoms which we regard as mosaic.

In the Northwest, the Hybrid Tea roses Premier Supreme, Matchless, Butterfly, Rapture, Templar and Gruss an Teplitz are most conspicuously affected.

Definite evidence of the occurrence of mosaic on Ragged Robin stocks in California was not observed, though a careful search was made in several representative nurseries. It is conceivable that the symptoms may have been masked, but the disease was evident on greenhouse grown roses in the same localities, and the field grown roses were making a vigorous and uniform growth, and showed a minimum of insect injuries and adverse environmental effects, thus permitting

ready diagnosis of the disease were it present. Neither was the disease observed in California on propagating stocks of the Texas Wax rose, but in Texas suggestive symptoms were shown in Magna Charta (H.P.) budded on Texas Wax roots.

Some budding stocks of Rosa multiflora japonica, which are propagated in the Pacific Coast States almost exclusively by cuttings, were found to contain an appreciable percentage of infected plants, others appeared to be entirely free from mosaic. Several instances were noted in Texas where mosaic-like symptoms occurred in this variety, but the prolonged drought there had so affected growth as to make positive identification impossible.

No commercial plantings were seen where mosaic was prevalent enough, considering the care that is exercised in the selection of rooted cuttings for budding, to affect seriously the general quality of salable plants, and the growers were found to be alert and receptive toward any information bearing on the significance and control of the disease. In a few instances, chiefly in the Manetti rose, there was evident multiplication of a relatively small amount of mosaic in mother blocks used as a source of cuttings. One or two instances indicate that the disease had increased in some other way than through vegetative propagation of diseased mother plants. In some cases more careful attention to roguing the rooted cuttings before budding them appears to be necessary, but the failure to recognize mosaic in the roses used as a source of budwood is a factor of at least equal importance in the perpetuation of the disease. The budding roses may indeed have been the original source of the disease, and unfortunately the symptoms in the Hybrid Tea varieties, when field grown, are usually much less conspicuous than in the varieties grown as roots.

A SCLEROTIUM DISEASE OF THE WHITE CALLA

By Freeman Weiss and Frank P. McWhorter

On July 29 at Brookings, Oregon, the writers found a field of about 7 acres of White or Nile Callas (Zantedeschia aethiopica) containing numerous small areas of dying plants. Examination of the underground parts showed a dense growth of white mycelium and sclerotia in various stages of development. The sclerotia formed on the host, and in artificial cultures subsequently made from infected plants, were about intermediate in size between those regarded as typical of Sclerotium rolfsii and those of the strain known as S. delphinii. The sclerotia were somewhat irregular in form and bore surface roughenings. This is believed to be the first record of the occurrence of Sclerotium on this host.

Infected plants showed a soft decay of the lower two-thirds of the main "bulb" (strictly, a corm), a decay which was not accompanied by the slime and putrid odor characteristic of the bacterial soft rot (Bacillus aroideae) of this host. The thick feeding roots were also involved and consumed, sometimes to a depth of 6 to 8 inches. In a few cases the base of the aerial structures was also invaded, and sclerotia were formed on them above ground. In other cases the exposed portions of the plant gave no immediate clue to the presence of the parasite but exhibited yellowing, flaccidity and marginal necrosis of the leaves much as in the Phytophthora root rot of Callas.

A subsequent visit was made to this field on September 7 by McWhorter. During the ensuing 40 days a few more centers of infection had appeared. Four typical infected areas (the Callas are closely planted in rows) staked July 30, had spread an average distance of three plants beyond the stakes. Examination of the apparently dead plants left in the marked areas showed that the fungus was no longer active, and that, in some cases, the bulbs were resuming growth as

indicated by the formation of feeder roots below and bud development in the crown above. The relatively cold weather of late August and early September appears to have definitely checked the fungus.

The field in question had been in cereal crops for one or two years previously and had never borne a crop of Callas or vegetables before. The fungus was probably introduced on the bulbs which were planted in the fall of 1929, and which were previously grown at Watsonville, California. The field there had borne several crops of vegetables, including snap beans, before it was planted to Callas; and this year carried a crop of tomatoes and sweet peppers. Examination of the tomatoes in 1930 showed a number of plants attacked by a Sclerotium, and these were especially numerous where the Callas had grown the preceding year.

Brookings is directly on the Pacific Coast a short distance north of the California line, and is in a region characterized by cool and typically rainless summers - the mean temperature from June to September being about 58° F., and the rainfall zero. Nevertheless this Sclerotium, which is regarded usually as restricted to warm regions, had caused considerable damage, in many cases spreading along the row to several plants removed from the probable original infection. It was surprising also to find it at Watsonville where the mean summer temperature is also low, about 60°, and practically no rain falls from the end of May till early September.

DISEASES OF CEREALS

REPORTS SHOW VERY SLIGHT LOSS FROM STEM RUST THIS YEAR

The unusualy weather conditions which prevailed this year throughout the country inhibited the development of stem rust to such an extent that the loss even to wheat was decidedly low or negligible.

Estimates received so far are given in the accompanying table.

Table 22. Estimated percentage losses from stem rust (Puccinia graminis) of cereals, 1930.

State	Reporter	Percentage loss			
		Wheat	Rye	Barley	Oats
*Ohio	Harry Atwood	0.5	0.1	0.1	0.1
*Indiana	Wayne E. Leer	0	0	0	0
*Wisconsin	- - -	winter 0.5	0	t	0
		spring 0.9	0	t	0
*North Dakota	George C. Mayoue				
	W. E. Brentzel	1.5	0	t	t
Colorado	E. A. Lungren	t	-	-	-

*Estimate received through Office of Barberry Eradication

Concerning the stem rust situation in Indiana, Wayne E. Leer, state leader for Barberry Eradication remarks that:

"Stem rust was so scarce in Indiana this year that it was almost impossible to find enough for physiologic form identification. I would say that stem rust losses in Indiana this year should be placed at 0 for each of the small grain crops. I did not find even a small area where I thought stem rust did any appreciable damage this year."

SOME REPORTS ON CEREAL DISEASES IN KANSAS

The loss from covered smut of wheat (Tilletia spp.) is estimated at 2 per cent. As a result of the campaign for seed treatment, the loss has steadily decreased.

The combined damage from loose and covered smut of oats (Ustilago spp.) is estimated at 6 per cent. It is believed that oat smut is on the increase in Kansas because of some new physiologic strains which are attacking varieties that heretofore were regarded as highly resistant. Growers have become neglectful in treating their seed and as a result the smut has increased.

The loss from corn smut (Ustilago zeae) for the state is estimated at 3 per cent. It was somewhat less than in other years, but most prevalent out in the western part of the State. It was striking to notice the large amount of smut in fields that had been damaged by hail. This is becoming a common observation and substantiates the statements that were made several years ago by the writer in publications to the effect that corn smut is always much more prevalent in fields that have been damaged by hailstorms.

The amount of damage from corn root rot is estimated between 2 and 3 per cent. There was so much damage from drouth that in many cases it was not easy to estimate the actual loss from root rot.

(L. E. Melchers, Oct. 1)

STINKING SMUT OF WHEAT IN MICHIGAN

Table 23. Stinking smut (Tilletia spp.) as found in 71 Michigan wheat fields inspected July 7 to 10, 1930 by J. H. Muncie and J. Kienholz.

County	Total number of fields inspected	Total number of acres	Maximum percentage of smut	Average percentage of smut
Allegan	10	285	17.5	2.5
Barry	2	30	20.0	.7
Berrien	24	460	22.5	2.0
Branch	3	23	2.0	1.4
Cass	5	95	6.0	.1
Eaton	15	305	27.5	5.3
Hillsdale	5	40	40.0	2.5
Jackson	2	40	.5	.3

Table 23 (con.)

County	Total number of fields inspected	Total number of acres	Maximum percentage of smut	Average percentage of smut
Kalkaska	1	20	t	t
St. Joseph	2	40	t	t
Schoolcraft	1	-	t	t
Van Buren	1	20	6	6
Totals and average	71	1,358	40	2.5

Note: These fields were not selected but were taken at random along the road without regard to seed treatment or other factors.

DISEASES OF VEGETABLE CROPS

INTERNAL HARD SPOT OF TOMATO IN OREGON

By Frank P. McWhorter

During the past month we have received inquiries from both eastern and western Oregon regarding an unusual tomato trouble which has hitherto not been called to our attention. Affected fruits on full ripening become as a rule distinctly pimpled with small circular hard areas which appear white beneath the tightly stretched epidermis. These circular areas occur in aggregates, thereby rendering the fruit unsightly, although few of the individual circles are more than 4 mm. across. The center of each circle is marked by a natural pore, beneath which is an enlarged air space. Sections through the pericarp show the circular areas to be associated with vein endings. There is little evidence of necrosis, but on the contrary a definite hyperplastic differentiation has taken place. The relative hardness of the tissues is in part accounted for by the presence of numerous cells packed with starch grains. No sign of a possible causal organism has been detected, but the possibility of the occurrence of some obscure bacterial or other parasite has not been eliminated. Other than the abnormality in the fruit no symptoms have been observed on affected plants; leaves and stems appear normal.

From an economic standpoint the fruits are a total loss. Housewives complain that affected fruits are tasteless and that they are useless for canning. It has been reported on several varieties, including Bonny Best and Jewel. Further, it is stated that not all the tomatoes on a plant are affected and that a plant may bear affected fruits for a while and later bear good fruits.

When first reported we supposed that irregularities in watering (including irrigation) were responsible. Examination of affected plantings near Portland where growing conditions were excellent and blossom-end rot of no consequence (there was none at the time) failed to substantiate this view. The writer would like to know of similar occurrences in other localities and of any significant ecological features which may have been observed.

VEGETABLE DISEASES IN THE IMPERIAL VALLEY OF CALIFORNIA

Powdery mildew of cucurbits (Erysiphe cichoracearum). Attacking all cucurbits including watermelon to a very considerable extent. Not only serious on the leaves but passes over to the fruits.

White pickle mosaic of cucurbits has been increasingly prevalent since 1928 and approximately 20,000 acres of a total acreage of 52,000 now show the disease. The disease first appeared on summer squash but is now also serious on various cantaloupe types including honeydews and Perfecto.

Fusarium wilt of watermelon has attacked about 5 per cent of the planted acreage. It has been of interest to note that other cucurbitaceous plantings are not affected even when planted with watermelons.

Nematodes (Caconema radicicola) attack all vegetable crops to a minor extent but probably not over one to two hundred acres in all infested. Carrots have been found especially susceptible.

The Ozonium root rot (Phymatotrichum omnivorum) appears to be working in from the Mexican side and is becoming increasingly prevalent on various vegetable crops. (J. B. Norton)

SOME MISCELLANEOUS REPORTS ON VEGETABLE DISEASES

Cabbage diseases in Wisconsin: Outbreak of black rot (Bacterium campestre) in several fields in Outagamie County traceable to purchased plants of unknown seed history. General loss slight.

More club root (Plasmodiophora brassicae) than usual. Occurred on cauliflower as well as cabbage in Brown, Outagamie and Racine Counties. Several new locations were observed this year. Spread slow. Farmers prefer to grow other crops on infested soil rather than attempt control with lime, etc. (R. E. Vaughan, Oct. 1)

Cauliflower diseases in Massachusetts: The following diseases have been observed in several fields in various parts of the State: 1. Black leaf spot (Alternaria brassicae) was observed causing severe spotting of the lower leaves of practically 100 per cent of the plants in a five-acre field in Franklin County. Generally the disease is doing only slight damage. 2. Bacterial leaf spot (Bacterium maculicolum), although observed in the Eastern, Central, and Cape sections of the State, is of little or no consequence to the crop generally. Only very light infections have been observed in any section. 3. Black rot (Bacterium campestre) which has been found in various sections of the State, is perhaps in its peak of infection, with the bulk of the crop just getting on the market. Severe infection with appreciable loss, has to date been observed in only one field in Franklin County. (O. C. Boyd, Sept. 18)

Onion purple blotch (Macrosporium porri) in Colorado: Severe infection locally in older fields around Rocky Ford. Newer plantings generally free. Severe in one field at Fort Collins. First appearance August 1 to 10. (D. Cation, Sept. 1)

DISEASES OF SPECIAL CROPS

RESULTS OF TOBACCO FIELD SURVEYS IN MIDDLE WESTERN STATES

SUMMARY OF THE TOBACCO FIELD SURVEY IN OHIO

A. L. Pierstorff

In Ohio tobacco is grown in two distinct areas. Burley is the dominant variety grown in southern Ohio. This region centers around Brown and Adams Counties. Dark tobacco is grown throughout the Miami County section with Montgomery and Miami Counties as centers.

In the Burley tobacco section drought caused severe decrease in yield and in some cases it also decreased the acreage which was set. Fields located in the valleys near streams looked good to fair, but fields planted on the hills were from a 50 to 90 per cent loss.

The most prevalent disease was mosaic. In some fields mosaic, which was transmitted by topping, ran as high as 75 per cent. In such cases the loss was small, because such leaves were not greatly dwarfed and usually could be sold for a fair price. In a few fields, which were planted late and where the growers pulled the beds three or four times, mosaic was quite common and caused a reduction in yield due to dwarfing of the plants.

Ring spot (virus) was found occasionally in this area as was also bacterial wilt (Bacterium solanacearum). As a whole diseases caused by bacteria or fungi were conspicuous by their absence throughout the tobacco area in Ohio.

In the Dark tobacco section the most common disease was Black Fire (non-par. In these reports Black Fire is used to designate a physiological spotting with concentric rings starting on the lower leaves. The highest percentage of infected plants found throughout the Miami section was 25 per cent with an estimated 2 per cent loss. Usually the loss estimated from Black Fire was negligible this year. A trace of ring spot, wild fire (B. tabacum), angular leaf spot (B. angulatum) and bacterial wilt were also found.

A number of fields were observed where mosaic caused considerable loss. One grower of seed-leaf had watered his seedbed with the juice obtained from securing old tobacco stalks. He did this in an attempt to drive away fleabeetle. Before soaking the stalks, he took them to a neighbor and had them ground in a hammer mill. The owner of the hammer mill thought it a good idea and ground some of his own stalks and also watered his seedbed. One hundred per cent mosaic resulted on both of these farms, where plants were used from the seedbeds which were watered with the tobacco juice. The seedleaf showed about 90 per cent loss, while the loss on the Dutch tobacco was estimated at 50 per cent. This clearly demonstrates how easily mosaic can be carried from one year's crop to the next.

INDIANA TOBACCO DISEASE FIELD SURVEY

R. W. Samson

A field survey for tobacco diseases was made on August 12, 13, 14 and 15, 1930, in Warrick, Spencer, Clark, and Floyd Counties. These Counties are located in the part of Indiana that was hardest hit by the extreme drought of the 1930 summer season. Consequently any disease effects on tobacco were masked or overshadowed by drought damage. Most growers expected about one-fourth of a normal yield. Some had started to harvest their crop just previous to the survey but a

good shower throughout the section during the night of August 13 caused most of the growers to stop with the hope that the plants would resume growth and produce a few more pounds to the acre. Tobacco was found in all stages from 6 inches tall to that which was being cut. Much was yet to be topped.

True tobacco mosaic and ringspot (Wingard) were the most common diseases observed. Spot necrosis, due to a potato virus, was observed in one field. The plants had been grown in a bed adjacent to potato plants. Mosaic was by far the most common. The extent of the damage caused by it could not be ascertained with any degree of exactness because any stunting due to it was overshadowed by the check in growth due to drought. Most growers referred to the disease as "dry french" and did not recognize its transmissible nature.

Ringspot was found practically everywhere and affected plants varied from a trace to 50 per cent or more in different fields. Whether the disease cut the yield or not could not be determined definitely but undoubtedly it will lower the quality.

The drought and the short tobacco crop has prevented any really comprehensive information being recorded concerning the importance of tobacco diseases in Southern Indiana by means of the seed bed and field survey this season. Mosaic and ringspot apparently are quite common and may be responsible for some damage in normal years. These are the only two diseases on which any particular information was received, however.

TOBACCO DISEASES FIELD SURVEY
WISCONSIN 1930

James Johnson

The outstanding feature of the tobacco disease field survey of Wisconsin in 1930 was the limiting effect of rainfall and temperature on infection and progress of such diseases as wildfire, blackfire, and Thielavia root-rot. On the other hand such maladies as mosaic and brown root-rot were apparently quite as common and injurious as if a normal growing season had prevailed. Naturally in the case of diseases which influence yield, it is not simple to estimate when and to what extent the weather conditions became responsible for the diminished growth observed. Long before the drought began to complicate the observations, however, heavy setbacks from brown and black root-rot were present generally. This was especially evident on account of the almost ideal conditions for transplanting and early growth. In some years, apparently, injurious dry and hot weather may as a result of subsequent timely rainfall prove beneficial to the crop if it is not so retarded as to bring it into other hazards such as hail, frost or poor curing weather. The dry and hot weather in Wisconsin in 1930 was practically not broken however until September 1. The drought was not so severe as to prevent the production of a large percentage of good crops in the State. The rainfall deficiency for the critical months of July and August at Madison was somewhat less than three inches and the average temperature was little more than 2 degrees above normal in August. Where conditions of the soil and the freedom from disease were not almost perfect, nevertheless, the decrease in yield and quality was very marked, with the result that the average yield in the State will probably be reduced as much as 250 pounds to the acre.

Brown root-rot consequent to the effect of preceding crops, usually sod-crops in Wisconsin, continued to be predominately the most serious menace to crop production. Fully 40 to 50 per cent of the entire acreage was more or less affected. Partial or complete recovery is perhaps more common in a season of

normal rainfall than it was in 1930. While practical crop failures or very low yields were common, quite as extensive a part of the damage consisted in the production of poor quality and late crops subject to additional hazards in the field and in the cure.

Black Root-rot (Thielavia basicola). The losses from black root-rot are greatly reduced in Wisconsin as compared with previous years on account of the general use of the root-rot resistant Havana 142 strain. However, many plantings are still made on infested soil with ordinary strains of Havana seed. The crop was planted relatively early and the month of June was relatively cool; consequently early Thielavia injury was frequently evident in the fields. While the hot and dry weather of July and August checked the disease, lack of rainfall prevented these crops from overcoming the early setback. Losses from the disease were therefore quite extensive in spite of apparently unfavorable weather for its progress.

Blackfire (angular leaf spot, Bact. angulatum) was very commonly present in the seed beds but was practically absent in the field. Occasional leaf infections were noted but no loss resulted. If the season had been wet this disease would no doubt have been very extensively present in the fields.

Wildfire (Bact. tabacum) was known to occur in about 24 seed-beds. Two or three additional cases were seen later in the fields. This disease made somewhat more headway in the field than did blackfire but caused no actual loss in the field as far as known.

Mosaic (virus) was the most common and serious leaf-disease in Wisconsin in 1930. Fields or parts of fields showing 50 to 100 per cent of infection were of relatively common occurrence. The disease was made particularly conspicuous by the extensive necrosis or "rusting" of the top leaves. Some fields showed very little or no mosaic and these were invariably on new ground. The heavy infections found were in practically all cases on old tobacco ground. Comparatively little of the infection seemed to have originated in the seed beds or developed as a consequence of handling at time of transplanting.

Potash-hunger symptoms were more common than ordinarily, perhaps intensified by the drought. These symptoms occurred more commonly on sodland than on old tobacco fields.

Frenching was conspicuous by its absence in 1930. Only one case was noted and that outside of the regular growing district.

A "disease" of unknown cause, also observed in previous years in Wisconsin was fairly common this season, but the total damage caused would still be relatively small. The disease is characterized by an interveinal necrotic breakdown of a few leaves located at about the middle portion of the plant. Some of these leaves are also commonly greatly reduced in size. Affected plants are either widely scattered or occur more commonly at ends of fields, particularly near buildings. It seems most likely at present that the condition results from some insect injury.

Insects. Cut-worms and wire worm damage was about normal for Wisconsin. Horn-worms were considerably more abundant than usual in some sections. Grasshopper damage was perhaps below the average. Flea beetle injury in the field was far above normal for Wisconsin.

Hail. Several local hailstorms struck the Wisconsin district. Sections west of Stoughton, north of Cottage Grove and Waunakee, and in the vicinity of Windsor, DeForest, Morrisonville, and Dane and parts of the northern district were affected. The last hail on September 1 fell after about one-third of the crop was harvested. No close estimate of the number of acres damaged exists at present, but it is safe to say that at least two thousand acres were more or less hail-cut in Wisconsin during the season.

(Sept. 10, 1930)

TOBACCO DISEASE FIELD SURVEY - MINNESOTA 1930

James Johnson

Minnesota grows between one and a half and two million pounds of tobacco. The growing areas are mostly scattered through several counties northwest of the Twin Cities. Culture of the crop, which is of the Havana Seed type and similar to Wisconsin tobacco, did not start seriously until about 1915; the land is therefore relatively new to tobacco. However, the continuous culture on the same land is normally practiced; consequently some fields which have grown tobacco from twelve to eighteen years were available for survey.

The drought was more intensive in the Minnesota district than in the principal Wisconsin tobacco districts; consequently the crop was relatively short. One of the principal points of interest that developed out of a short survey of the fields in three different counties was the failure to find Thielavia root-rot in even the oldest fields. It should be remembered in this connection, however, that the season was unfavorable for its development. Brown root-rot also appeared not to be present, though this is not surprising in view of the fact that most fields examined were in continuous culture to tobacco.

The most common disease present was mosaic, some fields or portions of fields showing infections on as high as 90 to 100 per cent of the plants. This disease appeared generally to have arisen from field soil infestation. Wildfire was not observed, and only one case of blackfire (Bact. angulatum) was noted. Cutworms are said to be the principal insect pest. Some flea-beetle damage was noted. A few fields were damaged by hail early in the season. (Sept. 10, 1930)

FRUIT DISEASES

PEACH YELLOWS REPORTED FROM TENNESSEE

Dr. M. B. Waite of the Office of Horticultural Crops and Diseases contributes the following statement regarding specimens received by him.

> "With a letter of October 2 to me, Prof. J. A. McClintock, of Knoxville, Tenn., sent in two sprout growths from near the base of a seedling peach tree, for verification of his diagnosis of peach yellows. The two twigs show the slender, wiry, lateral branches, broomlike but narrow, and extremely narrow leaves. They are, in fact, rather typical broomlike peach yellows growths. The only atypical thing about this case is that Prof. McClintock reports:
>
> "'The branches in the top of this tree have large deep-green leaves which look normal.'
>
> "Dark-green leaves often constitute the first preliminary symptom of peach yellows and may accompany the first season's premature red-spotted fruit. It is not usual, however, for the bushy and wiry growth to appear until the leaves have begun to roll and droop and turn yellow. Since peach yellows was abundant in peach orchards in the vicinity of Knoxville some fifteen years ago, and the locality is well within the known area of peach yellows distribution, there is little doubt of this being a slightly atypical case of the yellows."

RUST DISEASES OF THE APPLE

H. E. Thomas and W. D. Mills

Rust diseases of the apple in New York have been severe locally in 1930--more so than in 1929 and considerably less than in 1927 and 1928. In a number of orchards and varieties, mixtures of two diseases were found on the same trees. For example, 7.5 per cent of the fruits of Rome Beauty in one orchard bore both the apple rust (Gymnosporangium juniperi-virginianae), and the quince rust (G. germinale). Mixtures of apple rust and hawthorn rust (G. globosum) on apple foliage have been observed during the past four years in nine varieties. The production of aecia tends to be sparse with all the fungi this season and in many cases the peridia of G. juniperi-virginianae have been slow in dehiscence, resembling those of G. globosum more than usual. These variations are believed to be due to the exceptionally dry season.

Apple rust on the fruit is generally rather light. This disease on the foliage is severe in some orchards on the leaves toward the tips of the shoots, indicating that most of the infection took place relatively late. It is probable that the fruit passed through the most susceptible stage before the principal infection period or periods occurred. In a few orchards, however, considerable fruit infection occurred (a maximum of 40 per cent).

Quince rust has been more prevalent on apple fruits than the apple rust but in most orchards it has not been severe. The highest count in the Hudson Valley area was 22 per cent (on the Jonathan variety). This disease was found in Essex County in the Champlain Valley area on practically all the varieties commonly grown in that area (by A. B. Burrell and G. K. Parris). The loss was usually slight, however, in the orchards examined. In a single block of mixed Rome Beauty and McIntosh at Geneva, Ontario County, quince rust affected 41 and 11 per cent of the fruits of these varieties respectively. Traces or more of this disease on apple fruits were found in Yates, Schuyler, and Tompkins Counties in Central New York. A few affected fruits of Northwestern Greening were collected by K. G. Parker and A. L. Harrison on two farms near Williamson in Wayne County. On one of these farms, quince fruits were infected up to 62 per cent. Cedars are rare in this area (Counties bordering on Lake Ontario) and it is unlikely that rust diseases will become important in Western New York orchards.

To date quince rust has been seen in the following varieties of apples:

Alexander	Hubbardston	Sweet Winesap
Baldwin	Jonathan	(Henrick Sweet)
Ben Davis ?	McIntosh	Tallman Sweet
Cortland	Northern Spy	Twenty Ounce
Delicious	Northwestern Greening	Wealthy
Duchess	Rome Beauty	Winesap
Fameuse	Russett	Winter Banana
Gravenstein	Stayman	Wolf River
		Yellow Transparent

Determinations have been made for most of these on the pycnia of the fungus and the symptoms produced by the disease. Aecia of G. germinale have been seen on fruits of Fameuse, Hubbardston, Rome Beauty, and Winesap. Specimens have been examined bearing pycnia and in one case aecia, from Nova Scotia (sent by J. F. Hockey), New Jersey, Pennsylvania (R. S. Kirby), and western Tennessee (J. A. McClintock).

Hawthorn rust was rather generally prevalent in eastern New York but slight on most varieties. Moderate to severe infection was seen on Fameuse, Hubbardston,

Northwestern Greening, and Rhode Island Greening. Including the records of other years, this disease has been found on the foliage of the following varieties:

Baldwin	Northern Spy
Cortland	Northwestern Greening
Esopus Spitzenburg	Pewaukee
Fall Pippin	Rhode Island Greening
Fameuse	Rome
Gano	Russett
Golden Delicious	Stark
Hubbardston	Tallman Sweet
Jonathan	Tompkins King
McIntosh	Wagener
Newtown	Winesap
	York Imperial

RESULTS OF SPRAYING FOR APPLE SCAB IN A DRY YEAR

An interesting report on the results of spraying for apple scab (Venturia inaequalis) in Pennsylvania this year has been received from George L. Zundel.

"The fall checkup on apple scab in Central Pennsylvania is about half completed. Checkups have been made in the Counties of Blair, Bedford, Franklin, Huntingdon, Clinton, Dauphin, Snyder, Union, Columbia and Northumberland. To date over 51,900 apples have been counted with the following results which are preliminary only.

Spraying	Percentage Scab
Good.	0.44
Poor coverage	7.80
Delayed dormant missed.	8.70
Delayed dormant, prepink and pink missed. . .	17.50
Barrell outfits used.	3.50
Mixtures of non-recommended fungicides. . . .	17.80
Dusted.	34.60
Unsprayed	60.40

"Unsprayed trees ranged from 31.5 per cent scab in Bedford and Franklin Counties to 91 per cent in Snyder County and 92 per cent in Clinton County. The results in unsprayed trees prove the value of spraying in a dry year. Apparently fruit growers generally feel that there is no scab present this year and are inclined to think that they can ease up on spraying during the spring of 1931. This idea should be corrected as soon as possible. With favorable scab weather next spring there will be every need for very thorough spraying."

SOME SPECIMENS RECEIVED

Volutella buxi on Pachysandra sp., Stamford, Conn., W. H. Rankin.

Discosia artocreas on Rosa sp., Cincinnati, Ohio, O. T. Wilson. Determined by G. Hamilton Martin.

Laestadia berberidis on Mahonia sp., Washington, D. C., G. Hamilton Martin.

Leptosphaeria coniothyrium f. berberidis on Mahonia sp., Washington, D. C., G. Hamilton Martin.